



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,492	10/28/2003	Samantha S.H. Tan	10891/P01	5759
31647	7590	11/01/2006	EXAMINER KORNAKOV, MICHAIL	
DUGAN & DUGAN, P.C. 55 SOUTH BROADWAY TARRYTOWN, NY 10591			ART UNIT 1746	PAPER NUMBER

DATE MAILED: 11/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/696,492

Applicant(s)

TAN ET AL.

Examiner

Michael Kornakov

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-36, 38-41, 43-49, 51-81, 93, 95-97, 99-108 and 110-117 is/are pending in the application.
- 4a) Of the above claim(s) 73-81 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-36, 38-41, 43-49, 51-72, 93, 95-97, 99-108 and 110-117 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) See Continuation Sheet are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims subject to restriction and/or election requirement are 1-8,10-36,38-41,43-49,51-81,93,95-97,99-108 and 110-117.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/04/2006 has been entered.

Election/Restrictions

2. Applicant's election without traverse of claims 1-8, 10-36, 38-41, 43-49, 51-72, 93, 95-97, 99-108, 110-117 in the reply filed on 08/09/2006 is acknowledged. Claims 1-8, 10-36, 38-41, 43-49, 51-81, 93, 95-97, 99-108, 110-117 are currently pending. Claims 73-81 are withdrawn from consideration as being directed to non-elected invention. Claims 1-8, 10-36, 38-41, 43-49, 51-72, 93, 95-97, 99-108, 110-117 are examined on the merits.

Double Patenting

3. Provisional obviousness double patenting rejection over claims 28 and 40 of Application 10/627,416 is withdrawn since these claims have been amended and the Application 10/627,416 has been allowed as U.S. 7,091,132, which is directed to a different invention.

Art Unit: 1746

4. Applicants' amendment has overcome rejections under 35 USC 112 first and second paragraphs and the rejections are withdrawn.

Claim Objections

5. Claims 99-102 are objected to because claim 99 depends on claim 98, which is cancelled by Applicants and claims 100-102 directly or indirectly depend on claim 99. Since the proper dependency of claims is not established, claims 99-102 are not further treated on the merits.

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 64-66 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 64-66 recite the limitation "the container". There is insufficient antecedent basis for this limitation in the claim.

8. Claims 1, 10, 29, 105, 116, 117 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM Technical Disclosure Bulletin, vol.5, No.3, Page 36, further indicated as IBM.

IBM teaches cleaning molybdenum masks with a single aqueous solution

Art Unit: 1746

including HCl, wherein the concentration of HCl in the cleaning solution corresponds to the claimed range. After cleaning the mask is flushed with the stream of water. The teaching of IBM does not specifically indicate presence a series of metals deposited on the molybdenum mask, as recited in preambles of claims 1, 105, 116. However, it is noted here that a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone, consult *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976). Therefore, one skilled in the art would have found obvious to clean molybdenum mask with any deposits thereon, including a series of metal deposits, utilizing the method of IBM with the reasonable expectation of success.

With regard to predetermined period of cleaning time, it is noted here that cleaning time is result effective parameter, which depends on the concentration and other parameters of the cleaning solution and on the nature of deposits to be cleaned. However, discovery of optimum value of result effective variable in known process is ordinarily within the skill in the art and would have been obvious, consult *In re Boesch and Slaney* 205 USPQ 215 (CCPA 1980).

9. Claims 1, 10-12, 29-31, 105, 116, 117 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berasi et al (U.S. 5,744,214).

Berasi discloses conventional method of cleaning molybdenum mask by

Art Unit: 1746

placing the mask into a strong hot HCl solution to strip the process-deposited layers of chromium, copper, gold, lead and tin.

With regard to predetermined period of cleaning time and specific concentrations of HCl solution, it is noted here that these parameters are result effective since they affect the cleaning output. However, discovery of optimum value of result effective variable in known process is ordinarily within the skill in the art and would have been obvious, consult *In re Boesch* and *Slaney* 205 USPQ 215 (CCPA 1980).

10. Claims 2, 32, 36, 43, 46-49, 51-63, 67-72, 93, 106 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM in view of JP11-290805.

While teaching placing a molybdenum mask in a hydrochloric acid cleaning solution, IBM remains silent about agitating the cleaning solution. However, agitating the cleaning solution in order to enhance cleaning of metal mask is known in the art. Thus, JP'805 teaches ultrasonic agitating during the cleaning of metal mask (0007, 0008). Therefore, one skilled in the art motivated by JP'805 would have found obvious to ultrasonically agitate the cleaning solution in order to enhance cleaning of molybdenum mask in the teaching of IBM.

Regarding claims 46-49, the teaching of IBM/JP'805 does not specifically indicate the period of time for cleaning. However, discovery of optimum value of result effective variable in known process is ordinarily within the skill in the art and would have been obvious.

Art Unit: 1746

Regarding claims 51-63, the teaching of IBM/JP'805 does not specifically indicate that the agitation level is quantified in terms of agitation frequency or agitation power and does not specify the values of agitation frequency or agitation power. It is noted here that the agitation frequency or the agitation power represent conventional parameters of agitating process. It is also noticed here that these parameters are result effective, because they affect the physical conditions of cleaning liquid and therefore the effectiveness of cleaning process. However, discovery of optimum values of result effective variables in known process is ordinarily within the skill in the art and would have been obvious.

Regarding claims 67, 68 the teaching of IBM/JP'805 does not indicate any raise of the temperature of cleaning solution and therefore, it is believed that the cleaning process of IBM/JP'805 is performed at ambient conditions.

With regard to claims 69-72, reciting raised temperatures during the cleaning process, it is noted that the temperature of the wet chemical cleaning is result effective parameter, since it affects efficiency of cleaning such that it may accelerate removal of metal deposits from the surface of the mask and at the same time accelerate etching of the mask itself. Therefore, one skilled in the art would have found obvious to optimize the temperature in the cleaning method of IBM/JP'905. Also consult *In re Boesch* and *Slaney* 205 USPQ 215 (CCPA 1980).

Art Unit: 1746

11. Claims 2, 32, 36, 43-49, 51-63, 67-69, 72, 93, 103, 104, 106, 114, 115 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berasi et al (U.S. 5,744,214) in view of JP11-290805.

While teaching placing a molybdenum mask in a strong hydrochloric acid cleaning solution, Berasi remains silent about agitating the cleaning solution. However, agitating the cleaning solution in order to enhance cleaning of metal mask is known in the art. Thus, JP'805 teaches ultrasonic agitating during the cleaning of metal mask (0007, 0008). Therefore, one skilled in the art motivated by JP'805 would have found obvious to ultrasonically agitate the cleaning solution in order to enhance cleaning of molybdenum mask in the teaching of Berasi.

Berasi/JP'805 remains silent regarding specific parameters of the cleaning solution, such as concentration of HCl, agitation power, agitation frequency, temperature, and specific cleaning time, as recited in claims 46-49, 51-63, 67-69, 72, 103, 114, 115. However, since these parameters are result effective, as discussed above, one skilled in the art would have found obvious to optimize the indicated processing parameters in the cleaning method of Berasi/JP'905. Also consult *In re Boesch and Slaney* 205 USPQ 215 (CCPA 1980).

12. Claims 3-6, 33-35, 38, 39, 64-66, 95-97, 107, 108, 110, 111 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM in view of JP11-290805 and in further view of Spring (Metal Cleaning, Reinhold Publishing Corporation, 1963. pages 83-89).

The teaching of IBM and JP'805 is presented above and is incorporated here. IBM/JP'805 do not specifically indicate the structural elements of the processing equipment and the steps of handling the mask during the cleaning. It is noted here that the mask of IBM/JP'805 is made of metal. Spring teaches conventional approach to handling metal parts during their cleaning, wherein metal parts are placed into a container and the container is placed into the processing solution, which is contained into the vessel, surrounded by liquid and placed into another vessel, having transducers placed along its outside surfaces (Spring, pages 88-89).

Because both IBM/JP'805 and Spring are concerned with ultrasonic cleaning of metal parts in aggressive solutions and Spring teaches the conventional approach to such cleaning, one skilled in the art motivated by teaching of Spring would have found obvious to follow the handling steps of Spring, namely to put molybdenum mask in a container and place the container into a cleaning solution, which is contained into a first vessel and provide a second vessel with aqueous solution surrounding the first vessel, as per teaching of Spring in order to create the optimum environment for propagating the ultrasonic waves into the cleaning solution and contacting the ultrasonically activated cleaning solution with molybdenum mask, thus enhancing cleaning the mask in the teaching of IBM/JP'805.

Regarding claims 4, 6, 34, 39, 96, 97, 111 reciting closing the container and covering the vessel with a lid, one skilled in the art would have found obvious to do so in order to prevent spreading the vapors of hazardous cleaning solution into the

Art Unit: 1746

surrounding areas and provide safe working environment while cleaning the mask as per method of IBM/JP'805/Spring.

Regarding claims 64-66, Spring teaches the use of containers, made of plastics and the other materials, resistive to corrosive environment of cleaning liquids.

Therefore, one skilled in the art, motivated by Spring would have found obvious to utilize known acid corrosion resistive materials, such as Teflon or high density polyethylene for chemical containers, in the combined teaching of IBM/JP'805.

13. Claims 40, 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM/JP'805 and in view of Sachdev et al (U.S.2003/0066540).

While teaching cleaning molybdenum mask with HCl containing solution, followed by flushing molybdenum mask with water, the teaching of IBM/JP'805 remains silent about drying the mask with nitrogen. However, drying with nitrogen is conventionally utilized in the art for treating hard masks. Thus, Sachdev teaches cleaning the mask followed by drying with nitrogen as the final step in preparation the mask for subsequent use (0058). Therefore, one skilled in the art motivated by Sachdev would have found obvious to dry the mask with nitrogen upon cleaning in order to store the mask and prepare it for subsequent use the teaching of IBM/JP'805.

14. Claims 7, 8, 13-28, 112, 113 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM/JP'805/Spring and in view of Sachdev et al (U.S.2003/0066540).

While teaching cleaning molybdenum mask with HCl containing solution, followed by flushing molybdenum mask with water, the teaching of IBM/JP'805/Spring remains silent about drying the mask with nitrogen. However, drying with nitrogen is conventionally utilized in the art for treating hard masks. Thus, Sachdev teaches cleaning the mask followed by drying with nitrogen as the final step in preparation the mask for subsequent use (0058). Therefore, one skilled in the art motivated by Sachdev would have found obvious to dry the mask with nitrogen upon cleaning in order to store the mask and prepare it for subsequent use the teaching of IBM/JP'805/Spring.

With regard to processing parameters, such as agitation power, agitation frequency and specific cleaning time, as recited in claims 13-28, since these parameters are result effective, as discussed above, one skilled in the art would have found obvious to optimize the indicated processing parameters in the cleaning method of IBM/JP'805/Spring/Sachdev. Also consult *In re Boesch* and *Slaney* 205 USPQ 215 (CCPA 1980).

Response to Arguments

15. Applicant's arguments with respect to pending claims have been considered but are moot in view of the new ground(s) of rejection necessitated by Applicants' amendment.

Art Unit: 1746

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (571) 272-1303. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Michael Kornakov
Primary Examiner
Art Unit 1746

10/05/2006

Application/Control Number: 10/696,492
Art Unit: 1746

Page 12